

THE IRON TRADE OF SCOTLAND.

Seeing that the iron trade of this country now employs a large amount of wealth and enterprise, and that, in many districts, the mineral resources are yet only beginning to attract attention, it may not be uninteresting to take a brief glance at the history of this important branch of national industry. We have not sufficient data to trace its earliest commencement in this northern part of the kingdom, but it is believed that attempts were made at a remote period to extract iron from ore in open fires, of which evidences are supposed to exist in some of the higher mineral districts. About a century ago, the first application of pit coal for smelting iron was made in the south, previous to which we find that there were fifty-nine furnaces in England and Wales, producing at a very great cost, by means of wood fuel, about 17,000 tons of iron per annum, or about 240 tons from each furnace. Subsequently to the introduction of pit coal for fuel, furnaces were erected at Carron and Wilsontown, in Scotland, and, towards the close of last century, at Clyde, Muirkirk, Devon, and Onno. It has only been, however, during the last twenty-five years that the trade assumed any importance in this quarter, and we shall confine our remarks to the progress which it has made within that period.

As the best index to its condition, we give the following list of the selling prices of the best quality of foundry pig-iron per ton in the Glasgow market for the month of January in each year:—

1871—27	1876—47	1881—25	1886—53	1891—22
1872—5	1877—7	1882—41	1887—5	1892—3
1873—6	1878—6	1883—42	1888—5	1893—24
1874—6	1879—6	1884—43	1889—4	1894—22
1875—12	1880—5	1885—44	1890—3	1895—24

At the commencement of the above period, the number of furnaces in operation in Scotland was fifteen, and the average make of iron about 575 tons per week, or 25,650 tons per annum. In 1826, when an impulse had been given to the trade by the higher prices of the two preceding years, the number of furnaces increased to twenty-two, the weekly make to 780 tons, and the annual average to 36,900 tons. About this period an effectual struggle was made to obtain a reduction of duty on cast and wrought-iron imported from foreign countries, and we find Mr. Crawshaw, one of the largest ironmasters in Wales, in his evidence before a committee of the House of Commons, in 1825, stating that the annual make of iron in Great Britain was 600,000 tons, of which one-third was exported to foreign countries. The above produce may be apportioned as follows:—

South Wales.....	51 furnaces.....	221,000 tons.
North Wales.....	3	14,000 ..
Staffordshire.....	31	178,000 ..
Shropshire.....	26	90,000 ..
Yorkshire.....	22	35,000 ..
Derbyshire.....	14	30,000 ..
Scotland.....	17	29,000 ..
Total.....	204	600,000 ..

In 1826 the imports of Welsh pig-iron into the Clyde were 1,600 tons, and the general exports of Scotch about 8,500 tons, being, in both cases, a slight increase on the preceding year. The trade remained somewhat stationary, with gradually declining prices, until the effects of Mr. J. B. Neilson's hot-blast came into operation. The patent was obtained in 1829, but several years elapsed before its practical application with raw coal was accomplished. This opened an entirely new era in the iron trade of Scotland; the quantity produced from the same furnaces became at once more than doubled, while the consumption of coal, to each ton of pig-iron, was reduced to about one-fourth—hence an immense stimulus was given to the trade. Existing works were greatly extended, and new works were established in districts where, a few years before, the minerals were considered next to valueless. Thus it is, that, during the last fifteen years, the number of furnaces have become nearly quadrupled; and with recent improvements in the construction, the yield from each, on an average, may now be reckoned about treble the quantity which was formerly made with cold air and charred coal. At first there were complaints of the inferiority of the iron made by the new system, arising chiefly from the pig being more easily broke; but we believe it has been satisfactorily ascertained, from numerous experiments by practical men, that, with proper care in the selection, castings

produced from hot-blast iron are equally strong, and of as sound texture, as those made from cold-blast. It must, therefore, be evident that the application of heated air in smelting iron has been an incalculable benefit to the country, to the iron trade generally, and to the landed interest. It has cheapened the cost and increased the variety and usefulness of articles manufactured from iron; it has vastly augmented the consumption; and, but for this improvement, large tracts of land in the west of Scotland, now yielding a handsome return, would have remained at the former low value of surface rent. The extension of railway communication will open up other rich and extensive mineral fields, so that we may expect to see the iron trade of Scotland progressively increasing for many years to come. The average number of furnaces in operation last year was 65, and the weekly produce 6,600 tons, giving an annual make of 330,000 tons, or considerably above one-half of the entire make for Great Britain in 1825.

The following are the exports of Scotch pig-iron (in tons), as derived from authentic sources, for the last two years, exclusively of what was shipped by way of Liverpool, which, to America alone, must have amounted to a very considerable quantity:—

	Continental.	America.	Indies, &c.
1843.....	87,870	7,881	653
1844.....	30,719	11,719	613

In the former of these years the lowness of the price, and the prospect of increased duty in Germany, induced an extensive trade in pig-iron, a material portion of which was for conversion into malleable iron. In the event of any modification of the American tariff there will be a large demand for Scotch pig-iron for that quarter.

But there is another feature which speaks well for the future prosperity of the iron trade in Scotland. The peculiar character, the abundance, and the richness of the minerals, admit of iron being produced at less cost than in any district of either England or Wales; consequently, instead of importing from thence, as formerly, large quantities of Scotch iron are now sent to these districts—this, no doubt, arises chiefly from the cheaper cost, but another cause may be assigned. Scotch pig-iron is particularly adapted for making malleable iron, and as the present unparalleled demand for railways, ship-building, and other purposes, has outstripped the produce of pig-iron in some of the southern localities, it may be expected that recourse will be had to Scotland for increased supplies to meet the growing deficiency.

We may remark, that the manufacture of malleable iron is yet but in its infancy in Scotland, although making rapid strides towards an important position: there are five establishments, and the present make may be computed about 900 tons per week, or 45,000 tons per annum. For superior finish, toughness, and uniformity, it will stand comparison with either English or Welsh iron. — *Scottish Guardian*.

BRISTOL ACADEMY FOR THE PROMOTION OF THE FINE ARTS.—We recently alluded to the intention which existed of founding a Fine Arts Academy in Bristol, and are rejoiced to find that it has now assumed a tangible shape, and has come before the public with a list of donors and subscribers whose munificent contributions shew them to be not only earnest in carrying out the scheme, but determined to evince their zeal in the most effective and palatable form. The lady, whose princely donation, 2,000*l.*, heads the list, deserves the highest praise for her public spirit and liberality. All honour is likewise due to Mr. P. W. S. Miles, M.P., who originated this important movement, and to the gentleman associated with him, for combining to remove the stigma which rests upon Bristol in regard to the arts. The objects of the society are the advancement of the arts of painting in oil, fresco, and water-colours; of drawing in chalk; of the study of sculpture and to architecture; and of the other branches of the fine arts. The academy will be free to all artists residing within ten miles of Bristol for the previous twelve months, on their subscribing to its rules, and on certain conditions; and its arrangements will comprehend a school of painting and sculpture; pecuniary and honorary rewards to artists and students; exhibitions of pictures, &c., &c.; and an art union.

PROBABLE QUANTITY OF IRON REQUIRED FOR THE NEW RAILWAYS.

It has been estimated, that out of the numerous railway bills coming before Parliament next month, there will be forty-five carried, or about one-fifth of the present applications. Taking these lines at an average length of forty miles each, there will be 1,800 miles of railway to be formed, commencing from the autumn of this year, and extending over 1846; for, though these will not be all completed at that period, the deficiency may be more than made up by the lines which were passed during last session, and which are now being formed. A yard of railway requires 280 lbs. of rails, 98 lbs. of cast-iron chairs, and about 70 lbs. of iron girders—making 4 cwt. per yard, or 352 tons per mile. In addition to this, it is pretty clearly ascertained, that an equal amount of iron is required for each mile, in waggons, carriages, stations, engines, and locomotive establishments, &c.—making 700 tons of iron for each mile, or 1,260,000 tons for 1,800 miles of railways about to be constructed in this country, or, as nearly as possible, the whole make of iron in Great Britain for one year. This is independent of the contractors' rails, which are immense; and, if to this tremendous consumption be added what will be required for the new water and gas companies, the docks and other great public works, as well as the extra demand arising out of the prosperous trade of the country, it can hardly be conceived that our capabilities for the production of iron, great as they are, will be sufficient to supply what will be required. This is also entirely independent of our foreign trade, and as railways are likely to be constructed in almost every country, the exports of iron must also be greatly increased. Under these circumstances, there can hardly be a question that iron must shortly be much enhanced in value. — *Mining Journal*.

COMPETITION PLANS FOR BATHS AND WASH-HOUSES.

NOTWITHSTANDING the large number of applications for particulars, only twenty-two competitors have sent in plans, and it is said that as many as four-fifths of these have not complied with the published conditions. It is to be regretted that, with the exception of two or three sets, no attention whatever has been paid to ventilation in any of the designs. The number of drawings in the whole is 147.

A correspondent of *The Times* says,—"There are many places in London well adapted for the position of such establishments, a poor or thickly-populated neighbourhood of course being likely to prove the most advantageous and convenient to the class of people for whose use they are intended. London, from its local position, is fortunate in having wells, which produce most excellent water, and some of them are known to be more or less medicinal. Would it not be an advantage, therefore, for bathing purposes, to select a site where such a well is known to exist, so as to combine a common bath with a medicinal one, for such as may require it, on account of health, or for other reasons?" He suggests that a spring at No. 3, Old Belton-street, in the line of the intended new street between Holborn and the Strand, said to have been the resort of Queen Anne, might be made available.

ROOFING HOUSES WITH TIN.—John Woolley, Springfield, of Massachusetts, gives the following description of his plan for roofing houses with tin:—"What I claim as my invention is, constructing metallic roofs without boarding, by means of strips fastened to the rafters by cleats, to which the sheets of tin forming the roof are attached. I also claim the shield-plate under the eaves, constructed and arranged in the manner and for the purpose described."—The strips of tin are fastened on the top of each rafter, and extend from end to end, with the two edges turned up, and to these edges the sheets of tin forming the roof are connected, by lapping over these edges, and then turning down; and the shield-plate, referred to in the second section of the claim, is for catching and conducting into the gutter all the moisture that condenses under the roof. For this purpose, a plate extends from the gutter under the roof, there being sufficient space between this plate and the lower edge of the roof, for the water thus collected to pass out.